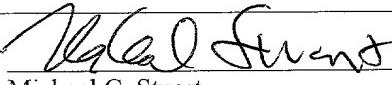


JC18 Rec'd PCT/PTO 08 NOV 2001

FORM PTO-1390 (REV 10-94)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		DOCKET #: 4925-171PUS
<b>TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371</b>				
				U.S. APPLICATION NO. <i>(If known, see 37 CFR 1.5)</i> <b>10/009430</b>
INTERNATIONAL APPLICATION NO <b>PCT/FI00/00422</b>		INTERNATIONAL FILING DATE <b>11 May 2000</b>		PRIORITY DATE CLAIMED <b>12 May 1999</b>
TITLE OF INVENTION <b>Method for Improving the Quality of a Telecommunication Connection and a Network Element</b>				
APPLICANT(S) FOR DO/EO/US <b>Sami HUUSKO</b>				
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:				
<p>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input type="checkbox"/> has been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). (see Reply to Written Opinion)</p> <p>b. <input type="checkbox"/> have been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). <b>Unexecuted</b></p> <p>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p>				
<b>Items 11. to 16. Below concern other document(s) or information included:</b>				
11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.				
12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.				
13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.				
<input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.				
14. <input type="checkbox"/> A substitute specification.				
15. <input type="checkbox"/> A change of power of attorney and/or address letter.				
16. <input checked="" type="checkbox"/> Other items or information ( <i>specify</i> ): PCT Publication Sheet, Int'l Preliminary Examination Report, Written Opinion, Reply to Written Opinion, Int'l Search Report, PCT Request, and PCT Demand				

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
<b>10/009430</b>	PCT/FI00/00422	<b>4925-171PUS</b>
17. [x] The following fees are submitted:		
<b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b>		
Search Report has been prepared by the EPO or JPO ..... \$890.00		
International preliminary examination fee paid to USPTO (37 CFR 1.482)..... \$710.00		
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))..... \$740.00		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$1040.00		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) ..... \$100.00		
ENTER APPROPRIATE BASIC FEE AMOUNT = <b>\$ 890</b>		
Surcharge of <b>\$130.00</b> for furnishing the oath or declaration later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(e)). <b>\$</b>		
Claims	Number Filed	Number Extra
Total Claims	17 - 20 =	0
Independent Claims	2 - 3 =	0
Multiple dependent claim(s) (if applicable)		+ <b>\$280.00</b>
TOTAL OF ABOVE CALCULATIONS = <b>\$ 890</b>		
Reduction of $\frac{1}{2}$ for filing by small entity, if applicable. <b>\$</b>		
SUBTOTAL = <b>\$ 890</b>		
Processing fee of <b>\$130.00</b> for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(f)). <b>\$</b>		
TOTAL NATIONAL FEE = <b>\$ 890</b>		
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by the appropriate cover sheet (37 CFR 3.28, 3.31). <b>\$40.00</b> per property + <b>\$</b>		
TOTAL FEES ENCLOSED <b>\$890</b>		
		Amount to be refunded: <b>\$</b>
		charged: <b>\$</b>
<p>a. [x] One check in the amount of <u>\$ 890</u> to cover the above fee is enclosed.</p> <p>b. [] Please charge my Deposit Account No. <u>03-2412</u> in the amount of <u>\$</u> to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. [x] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>03-2412</u>. A duplicate copy of this sheet is enclosed.</p>		
<b>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</b>		
SEND ALL CORRESPONDENCE TO <u>Michael C. Stuart</u> Cohen, Pontani, Lieberman & Pavane 551 Fifth Avenue, Suite 1210 New York, New York 10176		 <u>Michael C. Stuart</u> Registration Number: 35,698 November 8, 2001 Tel: (212) 687-2770

By Express Mail # EV011853835US · November 8, 2001

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a

Attorney Docket # 4925-171PUS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re National Phase PCT Application of

Sami HUUSKO

International Appln. No.: PCT/FI00/00422

International Filing Date: 11 May 2000

For: Method for Improving the Quality of a  
Telecommunication Connection and a Network  
Element

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents

Washington, D.C. 20231

BOX PCT

SIR:

Prior to examination of the above-identified application please amend the application as follows:

**IN THE SPECIFICATION:**

Page 1, before line 3, the paragraph beginning with "The invention relates", insert the following title:

**--FIELD OF THE INVENTION--**

Page 1, before line 6, the paragraph beginning with "In mobile communication", insert the following title:

**--BACKGROUND OF THE INVENTION--.**

Page 2, before line 22, the paragraph beginning with "An object of this invention", insert the following title:

**--SUMMARY OF THE INVENTION--.**

Page 3, delete the paragraph from line 4 to 5 beginning with "Other advantageous".

Page 3, before line 20, the paragraph beginning with "The invention is", insert the following paragraph and title:

-- Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are intended solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims.

**BRIEF DESCRIPTION OF THE DRAWINGS--.**

Page 3, before line 26, the paragraph beginning with "Like elements in", insert the following title:

**--DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS--.**

Page 8, after the last line, insert the following paragraph:

--Thus, while there have been shown and described and pointed out fundamental novel features of the present invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices described and illustrated, and in their operation, and of the methods described may be made by those skilled in the art without departing from the spirit of the present invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Substitutions of elements from one described embodiment to another are also fully intended and contemplated. It is also to be understood that the drawings are not necessarily drawn to scale but that they are merely conceptual in nature. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.--.

Page 9, line 1, delete "Claims" and insert therefor --What is claimed is:--.

IN THE CLAIMS:

Please amend 4 to read as follows:

4. A method according to claim 2, characterized in that from the mobile station (101) an IP address is sent to an Internet server (204) for establishing a circuit-switched connection.

Add the following new claims:

17. A method according to claim 3, characterized in that from the mobile station (101) an IP address is sent to an Internet server (204) for establishing a circuit-switched connection.

**REMARKS**

This preliminary amendment is presented to place the application in proper form for examination and to eliminate multiple dependency from the present claims. No new matter has been added. Early examination and favorable consideration of the above-identified application is earnestly solicited.

Attached hereto is a mark-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Amendments to the specification and claims showing changes**".

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,  
COHEN, PONTANI, LIEBERMAN & PAVANE

By:



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8 November 2001

By Express Mail # EV011853835US · November 8, 2001

**AMENDMENTS TO THE SPECIFICATION AND CLAIMS SHOWING CHANGES**

In the Claims:

4. A method according to [claims] claim 2 [and 3], characterized in that from the mobile station (101) an IP address is sent to an Internet server (204) for establishing a circuit-switched connection.

G E D E M I L D E P O S T

## Method for improving the quality of a telecommunication connection and a network element

The invention relates to a method for transmitting data in data networks, in which method it is ensured that data, especially speech data, is transmitted through a good enough telecommunication connection from the sender to the recipient.

In mobile communication systems the trend is toward packet-based transmission. The idea in packet-based transmission is to transmit the data in packets, so that the connection is used only when data is being transmitted. According to the present transmission arrangement data is transmitted using a circuit-switched arrangement in which the transmission channel is open all the time regardless of whether data is being transmitted or not.

The option of packet-based transmission is about to be included in present digital mobile communication systems, such as the GSM. This is accomplished e.g. by means of the so-called General Packet Radio Service (GPRS) network, the connection of which to, say, the GSM network calls for some new network elements and some changes in the old network elements.

Fig. 1 illustrates a possible arrangement of a GPRS network. Shown in the figure is a mobile station 101 which is connected via a base station 102 and base station controller 103 to a mobile switching center 104. A plurality of different networks, such as a public switched telephone network (PSTN) 105 and an SS7 network 106, for example, may be connected to the mobile switching center 104. The base station controller 103 includes a new network element (PCU, or, Packet Control Unit) 107 which controls the data packets. The packet network proper 114 is connected through the packet control unit 107 to the rest of the network topology. Between the GPRS backbone network 113 and the packet control unit 107 there is a serving GPRS support node (SGSN) 108. The GPRS network also includes a GPRS register 109 which stores information about GPRS equipment, for example. The GPRS network further includes gateway GPRS support nodes (GGSN) 110 through which other packet-based networks 111, such as Internet, OSI data, or X.25 networks, may be connected to the GPRS network. A continuous line between elements in Fig. 1 indicates that there is both data transmission and signaling between the elements. A broken line represents signaling between elements.

The introduction of the packet system brings about changes in terminal equipment. According to a proposal, terminal devices are categorized into three classes A, B

and C. Of these, class A terminals are the most advanced and are highly suitable for both packet-based and circuit-switched data transmission. In class A devices both a packet-switched and a circuit-switched connection may be active simultaneously. Class B devices are a little simpler and in them both the packet-switched and 5 circuit-switched connection may exist simultaneously but only one of them may be active at a time. In class C devices, only one of said two connections may be established at a time. A special case of the C class is a terminal device designed purely for packet-based transmission.

Other networks see the GPRS network as an Internet subnetwork. The GPRS network has addresses of its own, which comply with the Internet Protocol (IP). In 10 addition to the GPRS network addresses, mobile stations as well as other network elements in the network have IP addresses that facilitate data transmission between the sender and recipient.

In various packet-based data transmission applications, such as e.g. Internet applications, data may have many different forms. Data may consist of text, speech, 15 images or the like. As data is transmitted in packet format through the GPRS network a problem may arise from the fact that the quality of the data transmitted deteriorates during the transmission for various reasons. The quality of the data is important e.g. in applications in which the data packets transmitted consist of speech 20 data. One such application may be e.g. an Internet call. In such data types the quality of the data transmitted is affected by the delay of data packets, for example.

An object of this invention is to provide a method for keeping the quality of a connection good, especially in applications in which the data transmitted, such as speech data, requires a good transmission channel quality.

25 The objects of the invention are achieved by an arrangement in which data is transmitted using both packet-based transmission and circuit-switched transmission. Packet-based transmission is used when the data transmitted is such that a possible deterioration of data quality, caused by delays, for instance, will not degrade the intelligibility of the information contained in the data at the receiving end. Circuit- 30 switched transmission is used when the data transmitted is of a type the intelligibility of which is affected by a possible deterioration of data quality.

The method according to the invention is characterized in that at least part of the data transmitted through a packet-switched connection is arranged so as to be transmitted at least partly through a circuit-switched connection.

The network element according to the invention is characterized in that it is adapted so as to transmit at least part of the data transmitted through a packet-switched connection at least partly through a circuit-switched connection.

Other advantageous embodiments of the invention are specified in the dependent  
5 claims.

In accordance with the invention an arrangement is realized by means of which speech data or the like is not transmitted in packets, but a circuit-switched connection is used to transmit the speech data or the like. The speech data or the like is separated from the rest of the data stream and directed at least partly through a

10 circuit-switched connection to the recipient. The connections are optimized in such a manner that the capacity is used as efficiently as possible from the network standpoint. According to an advantageous embodiment of the invention the speech data or the like is transmitted between an Internet network and mobile station at least partly through a circuit-switched connection. According to a second advantageous  
15 embodiment the speech data or the like is transmitted between the packet-switched GPRS backbone network and mobile station at least partly through a circuit-switched connection. According to a third advantageous embodiment the speech data or the like is transmitted between a serving GPRS support node and mobile station at least partly through a circuit-switched connection.

20 The invention is described in detail in the following, referring to the accompanying Figures in which

Fig. 1 shows a possible topology of the GPRS network,

Fig. 2 shows a possible arrangement according to the invention,

Fig. 3 shows a second possible arrangement according to the invention, and

25 Fig. 4 shows a third possible arrangement according to the invention.

Like elements in the Figures are denoted by like reference designators. Fig. 1 was discussed above in conjunction with the prior art.

Fig. 2 shows a first embodiment according to the invention for setting up a connection from a mobile station 101 to an Internet network 203 through a packet-switched

30 network. The Internet network 203 is shown to comprise one Internet server 204 with an Internet telephone connection 205. In addition to these network elements Fig. 2 shows a base station 102, base station controller 103, serving GPRS support

node 108, GPRS backbone network 113, gateway GPRS support node 110, mobile switching center 104 and a gateway (GW) 201. Between the elements there are suitable interfaces to serve the communication between the elements. Exemplary interfaces are shown in Figs. 2, 3 and 4.

- 5 Let us next consider a situation according to Fig. 2 in which the user of a mobile station 101 has initiated on his class A terminal device a connection to an Internet network 203, in which connection data is transmitted in packets. In this exemplary situation the Internet user wants to set up an Internet call to a person who has on his web site, for example, a so-called click-and-talk button by means of which an Internet 10 call can be established. Thus at least speech data is transmitted during the Internet connection, but some other type of data may be transmitted, too. Normally an Internet call is established through the packet-switched GPRS network. In the arrangement according to the invention the mobile station 101 is arranged, upon establishing an Internet call, to set up a connection via a base station controller 103 to a mobile switching center 104 and further to a gateway 201. The advantage is that the connection from the mobile station 101 to the gateway 201 can be realized at 15 least partly as a circuit-switched connection whereby the quality of the speech data transmitted can be kept better in the transmission. It is obvious to a person skilled in the art that the data sent to and received from the Internet network is in packet format, wherefore said gateway 201, along with other possible functions, is arranged so as to convert the speech data transmitted through the circuit-switched 20 connection to packet format and vice versa.

When the user initiates a connection to an Internet server 204, IP addresses are used in the establishment of the connection. In this explanatory embodiment the mobile 25 station 101 has an IP address of its own, to which address packet-based data sent from or via the Internet can be transmitted through the GPRS network. If the user of the mobile station 101 initiates a speech connection through a data transmission connection using the Internet Protocol, a second IP address may be advantageously arranged for the mobile station 101, to which second IP address the speech data is 30 transmitted through a circuit-switched connection. Advantageously the address is such that data sent to the address is transmitted from the Internet network to the gateway 201. As the packet-form speech data arrives at the gateway 201, the gateway 201 converts the packet data into data to be transmitted through the circuit-switched connection and transmits said data to the mobile station 101 in accordance 35 with the second IP address sent by the mobile station 101. If there were no separate address for speech data, the speech data would be transmitted to the mobile station

101 together with other possible data through the packet-switched GPRS network. It is obvious to a person skilled in the art that the speech data sent from the mobile station 101 is also transmitted via the gateway 201 at least partly through a circuit-switched connection to the recipient connected to the Internet network.

- 5    The mobile station 101 must send to the Internet server 204 the address to which the speech coming from the Internet is directed in packet format so that the speech data can be transmitted through the circuit-switched connection to the mobile station 101. Said IP address may be conveyed in many ways. According to a first example the mobile station 101, when establishing a circuit-switched connection via a mobile  
10 switching center 104 and gateway 201, may send the information of the IP address used in the speech connection to the Internet server 204 in a short message. The Internet server 204 reads the address in question and uses it to transmit the speech data. According to a second example the IP address may be sent in a predetermined packet, such as the first packet, to the Internet server 204. The Internet server 204  
15 reads the address sent and uses it for the transmission of speech data. According to a third example, an arrangement is realized in a suitable network element e.g. as a database solution according to which a second identifier, such as a second IP address, is attached to the subscriber identification proper of the mobile station 101, to which address the speech data or the like is transmitted. An advantageous location for the identifiers is e.g. the visitor location register (VLR) of the mobile switching center 104. It is obvious to a person skilled in the art that the identifiers may be placed in other such network elements, such as the gateway 201, in which  
20 the data can be stored. When a connection is being set up, the device in question finds in the visitor location register in addition to the first subscriber identification  
25 data the second subscriber identification data including at least the address to which speech data is to be transmitted. By means of the address it is possible to establish a circuit-switched connection at least between the mobile station 101 and gateway 201 for the transmission of speech data.

- 30    In a second advantageous embodiment according to the invention, as depicted in Fig. 3, there is a connection from a base station controller 103 to a mobile switching center 104 in connection of which there is a gateway 201 such as the one described above. In this embodiment the gateway 201 is connected to a node 301 in the packet-switched GPRS backbone network 113. Further, the GPRS backbone network 113 is connected through a gateway GPRS support node 110 to a network  
35 using the IP protocol, such as the Internet network 203. A solution according to this arrangement requires that the gateway GPRS support node 110 is adapted so as to

separate the speech data packets coming from the gateway 201 and going to the gateway 201 from the other data packets going to the serving GPRS support node 108. It is obvious to one skilled in the art that node 301 in the GPRS backbone network is arranged so as to be as close as possible to the IP network 203 to which a connection has been established, so that a possible deterioration of the quality of the data transmitted through the circuit-switched connection can be eliminated.

In a third embodiment according to the invention the gateway 201 can be directly connected to a serving GPRS support node 108, as depicted in Fig. 4. The mobile station 101 uses a circuit-switched connection for the transmission of speech data up to the gateway 201 which converts the circuit-switched data into packet format and sends the speech data packets to the serving GPRS support node 108. The serving GPRS support node 108 is arranged so as to see from the speech packets coming from the gateway 201 that the transmission of data is now being carried out in both directions through the gateway 201 and mobile switching center 104. Advantageously this is arranged in a similar manner as e.g. a handover between two base stations 102. It is obvious to a person skilled in the art that this third embodiment according to the invention requires that the gateway 201 supports an interface enabling the arrangement described above. One such interface is the Gb interface of the UMTS (Universal Mobile Telecommunication System) network. It is obvious to one skilled in the art that the requirements according to the third embodiment of the invention can be met by realizing the necessary modifications in the serving GPRS support node 108.

The connections described above are optimized in such a manner that the capacity is utilized as efficiently as possible from the network standpoint. One possible way of optimizing the use of capacity is to leave out, where possible, the connection information needed in the data transmission and to transmit only the data proper. An arrangement like this can be realized for data traffic between a mobile station 101 and gateway 201 where, according to an embodiment of the invention, the whole IP protocol may be left out.

It is obvious to a person skilled in the art that in the fourth and fifth embodiments described above the mobile station 101 may be a class A, class B or class C device because the arrangements described above do not require a simultaneous circuit-switched and packet-switched connections at the mobile station 101.

The gateway 201 described above is depicted as a separate network element but it is obvious to one skilled in the art that the gateway 201 may be integrated into a suitable network element, such as a mobile switching center 104.

One possible arrangement for guaranteeing the connection quality is one in which the network elements providing packet-switched data transmission service monitor the quality of the connection. What is meant by this is that the network elements may e.g. monitor the data packet delays and other such quantities related to data transmission. Advantageously the monitoring is arranged in such a manner that if a network element notices e.g. that data packet delays become too long, i.e. the capacity of the packet-switched service is not sufficient to transmit all data with good enough quality, at least part of the data transmitted is arranged so as to be transmitted through a circuit-switched connection in accordance with the above description. It is obvious to a person skilled in the art that in the first, second and third embodiments described above the notion is to make sure in advance that the quality of the connection is good enough for the transmission of the data in question.

The embodiments described above have mainly related to the transmission of speech data through a circuit-switched connection but it is obvious to one skilled in the art that the invention is in every respect applicable to a situation in which the speech data is transmitted through a GSM speech channel. The invention can be applied, within the scope of the inventional idea defined by the claims, to the transmission of data such as speech data through a circuit-switched connection so that the quality of the data in question can be guaranteed to be sufficient from the receiver's standpoint.

It is obvious to a person skilled in the art that the connection described above, which is at least in part a circuit-switched connection between the terminal and gateway 201, can be understood in a broader sense. In addition to the connection types mentioned here the connection may be e.g. a circuit-switched data connection through which IP packets containing speech information can be transmitted. On the other hand, the connection may be e.g. a circuit-switched speech connection. One such connection is typically a so-called bearer in the GSM system, for example. In the case of a circuit-switched data connection the speech in the IP packets remains unchanged from the beginning to the end of the connection, whereby the gateway 201 will not convert the speech data from the circuit-switched connection into a form suitable for a packet-switched connection. It is unnecessary since the speech data in the IP packets is suitable as such to be transmitted through the packet-switched connection. In the case of a circuit-switched speech connection the gate-

way 201 converts the speech information into packet form so that it is suitable to be transmitted through a packet-switched connection.

It is obvious to a person skilled in the art that while it was above discussed the application of the GPRS network almost solely in connection with an Internet network, it may also be applied to other corresponding network topologies realizing packet switching. The names of the network elements mentioned above are not in any way limiting, but it has been our intention to follow, where applicable, the naming conventions used in the present GSM network.

**Claims**

1. A method for guaranteeing the quality of a connection in a data-transmitting telecommunication system, where the data is arranged so as to be transmitted through a packet-switched connection, characterized in that at least part of the data transmitted through the packet-switched connection is arranged so as to be transmitted at least partly through a circuit-switched connection.  
5
2. A method according to claim 1, characterized in that at least one of the parties to the connection is a mobile station (101).
3. A method according to claim 1, characterized in that the data is transmitted  
10 through at least one Internet server (204).
4. A method according to claims 2 and 3, characterized in that from the mobile station (101) an IP address is sent to an Internet server (204) for establishing a circuit-switched connection.
5. A method according to claim 4, characterized in that the mobile station (101)  
15 sends an IP address to an Internet server (204) in the form of a short message.
6. A method according to claim 4, characterized in that the mobile station (101) sends an IP address to an Internet server (204) in a certain packet in the packet data stream.
7. A method according to claim 2, characterized in that a subscriber-specific IP  
20 address stored in the mobile communication network is used for the establishment of a circuit-switched connection.
8. A method according to claim 1, characterized in that at least part of the data transmitted through a circuit-switched connection is speech data.
9. A method according to claim 8, characterized in that said speech data is transmitted  
25 at least partly through a circuit-switched connection between the GPRS backbone network (113) and the mobile station (101).
10. A method according to claim 8, characterized in that said speech data transmitted at least partly through a circuit-switched connection is transmitted from the gateway (201) directly to an Internet server (204).

11. A method according to claim 1, characterized in that at least part of the data transmitted through a packet-switched connection is arranged so as to be transmitted through a circuit-switched connection if the capacity of the packet-switched connection is insufficient.

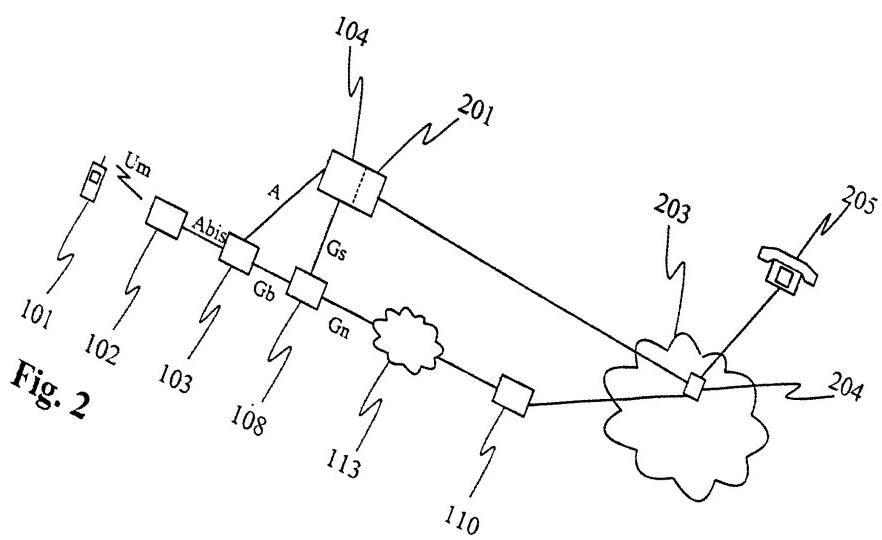
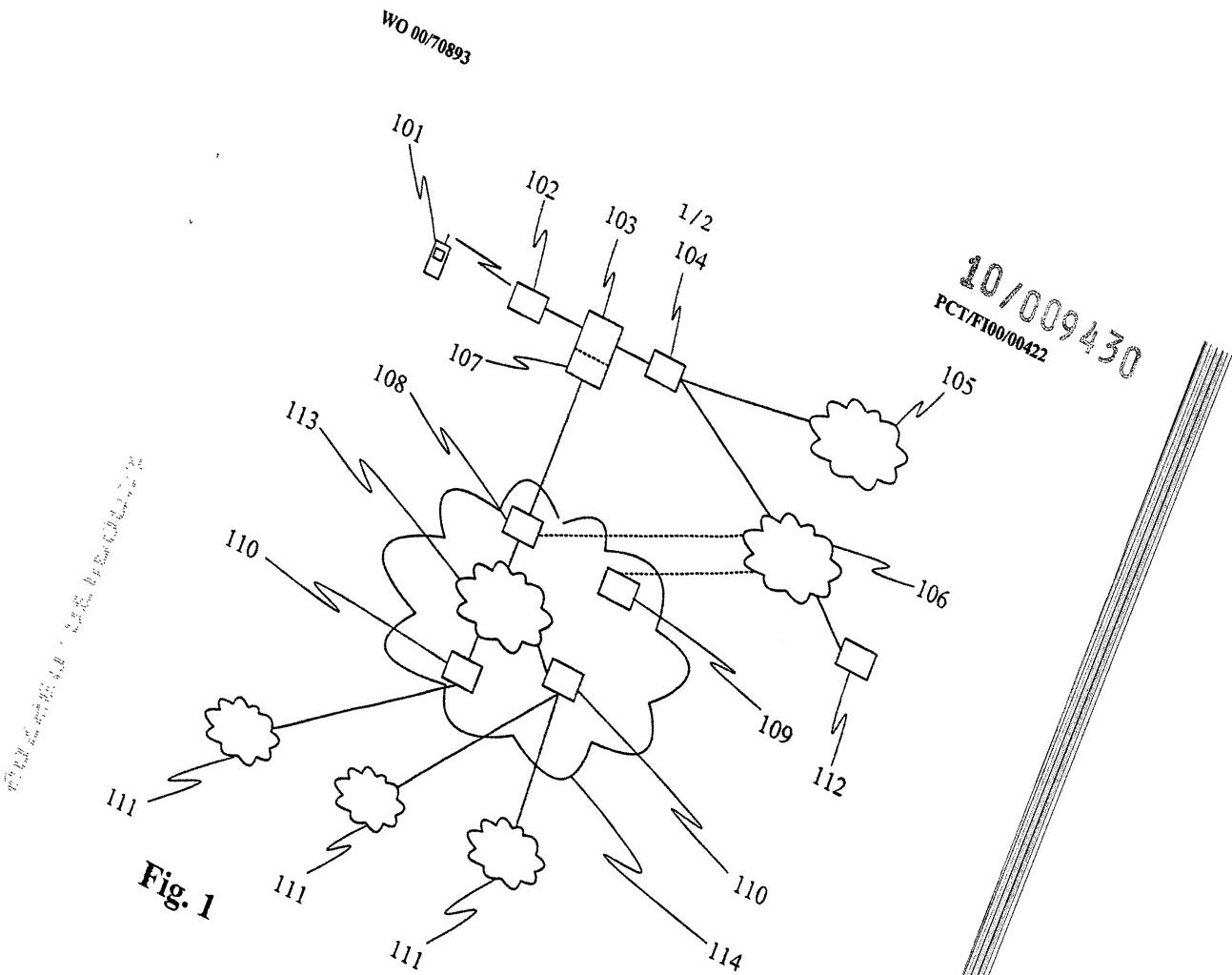
5 12. A method according to claim 10, characterized in that the quality of the packet-switched connection is monitored during the connection.

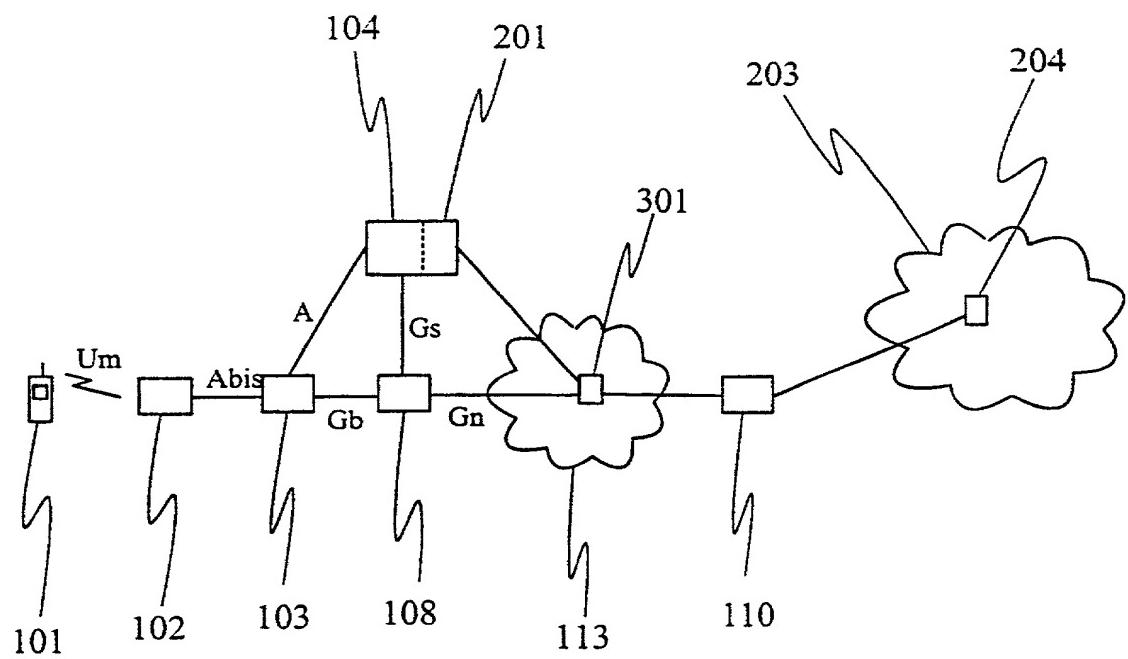
13. A network element for guaranteeing the quality of a connection in a data-transmitting telecommunication system, where the data is arranged so as to be transmitted through a packet-switched connection, characterized in that the network element is arranged so as to transmit at least part of the data transmitted through a packet-switched connection at least partly through a circuit-switched connection.

10 14. A network element according to claim 13, characterized in that the network element is arranged so as to convert the packet data into a form suitable for a circuit-switched connection and vice versa.

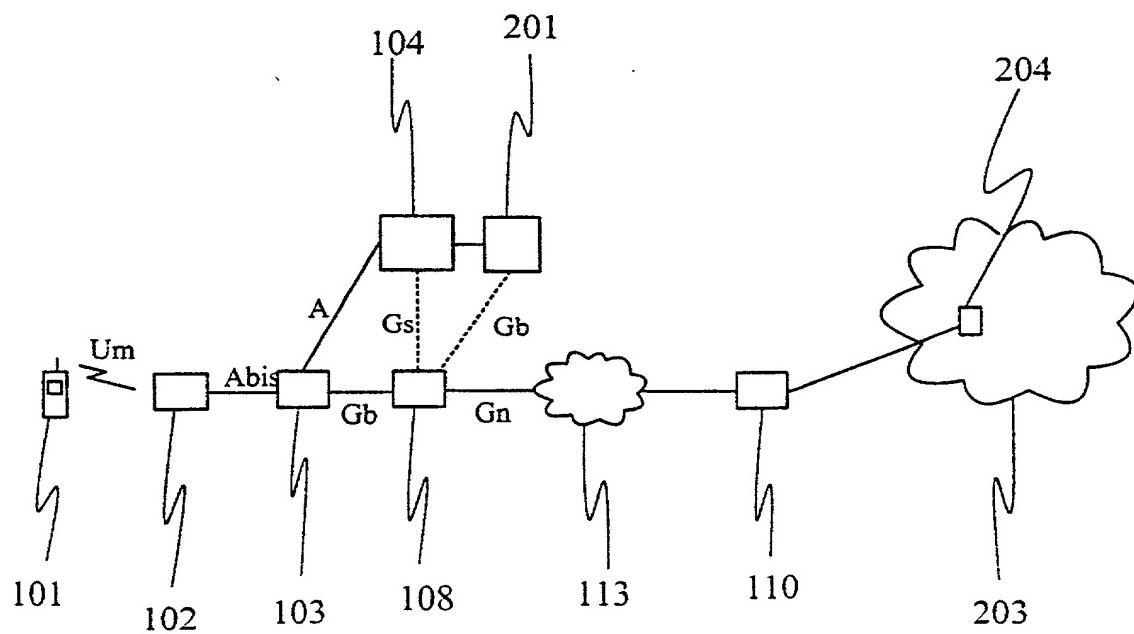
15 15. A network element according to claim 13, characterized in that it is a gateway (201).

16. A network element according to claim 13, characterized in that it is a mobile switching center (104).





**Fig. 3**



**Fig. 4**

**COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY**  
 Includes Reference to PCT International Applications

Attorney's Docket No.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**METHOD FOR IMPROVING THE QUALITY OF A TELECOMMUNICATION CONNECTION AND A NETWORK ELEMENT**

the specification of which (check only one item below)

[ ] is attached hereto  
 [ ] was filed as United States application  
 Serial No.  
 on  
 and was amended  
 on \_\_\_\_\_ (if applicable).  
 [x] was filed as PCT international application  
 Number PCT/FI00/00422  
 on May 11, 2000  
 and was amended under PCT Article 19  
 on

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of the application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

**PRIOR FOREIGN/PCT APPLICATIONS AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

Country (if PCT, indicate "PCT")	Application Number	Date of Filing (day, month, year)	Priority Claimed Under 35 U.S.C. 119	
Finland	991092	12 May 1999	[x] YES	[ ] NO
PCT	PCT/FI00/00422	11 May 2000	[x] YES	[ ] NO
			[ ] YES	[ ] NO
			[ ] YES	[ ] NO
			[ ] YES	[ ] NO
			[ ] YES	[ ] NO
			[ ] YES	[ ] NO

Combined Declaration for Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications)	Attorney's Docket No.
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I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS (check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)		
PCT/FI00/00422	11 May 2000		X	

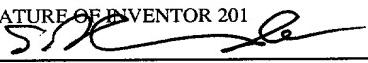
**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (*List name and registration number*)

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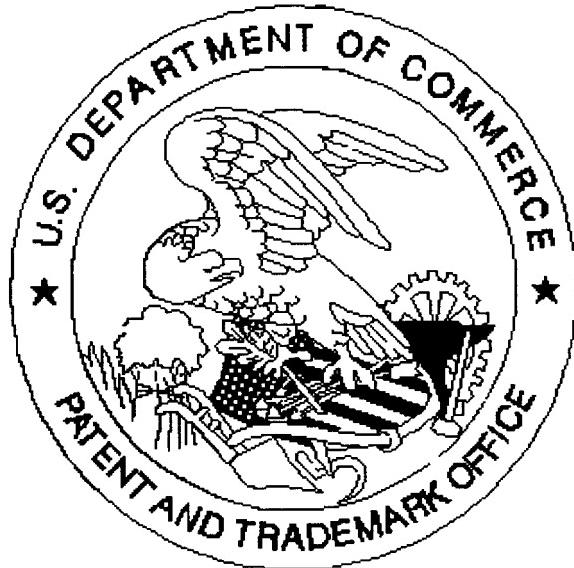
Send correspondence to: <u>Michael C. Stuart</u> Reg. 35,698 <u>Cohen, Pontani, Lieberman &amp; Pavane</u> <u>551 Fifth Avenue, Suite 1210</u> <u>New York, New York 10176</u>	Direct Telephone calls to: (name and telephone number) <u>Michael C. Stuart</u> (212) 687-2770
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	POST OFFICE ADDRESS		CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201 	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
DATE 16 November 2001	DATE	DATE
SIGNATURE OF INVENTOR 204	SIGNATURE OF INVENTOR 205	SIGNATURE OF INVENTOR 206
DATE	DATE	DATE
SIGNATURE OF INVENTOR 207	SIGNATURE OF INVENTOR 208	SIGNATURE OF INVENTOR 209
DATE	DATE	DATE
SIGNATURE OF INVENTOR 210	SIGNATURE OF INVENTOR 211	SIGNATURE OF INVENTOR 212
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